Claims

1. An optical lens element including

a front and back surface capable of forming a prescription (Rx) zone; and

a peripheral temporal zone.

2. An optical lens element according to claim 1, wherein the front and/or back surface(s) of the optical lens element include a spherical or toric component to provide the desired prescription (Rx) in the prescription zone.

3. An optical lens element according to claim 2, wherein the lens element is adapted for mounting in a frame of the wrap-around or shield type, such that the lens is rotated temporally about a vertical axis through the optical centre thereof.

4. An optical lens element according to claim 1, wherein the peripheral temporal zone is at least in part of generally toric shape.

5. An optical lens element according to claim 4, wherein the peripheral temporal zone is at least in part generally plano.

6. An optical lens element according to claim 5 wherein the curvature of the front surface is modified in the peripheral temporal zone to substantially correspond to the curvature of the back surface.

7. An optical lens element according to claim 1, wherein the lens element is modified to permit light control within the peripheral temporal zone.

8. An optical lens element according to claim 7, wherein the lens element includes one or more of the group consisting of a mirror coating, a light control coating, a reflective coating or a light control tint within the peripheral temporal zone.

9. An optical lens element providing prescription (Rx) correction generally in the range -6.0 D to +6.0 D with 0 to +3 cyl

wherein the front surface is capable of being mounted in a frame of constant design curve irrespective of the Rx, such frame curves being 5.0 D and above; and

the back surface provides good clearance from temples or eye lashes.

10. An optical lens element according to claim 9, wherein the front surface is capable of being mounted in a frame of constant design curve of between 8.0 D and 9.0 D.

11. An optical lens element according to claim 9, wherein the front surface of the lens element has a high curve extending from nasal to temporal limits, but the vertical curve is 6.0 D or below.

12. A unitary lens including a pair of optical lens elements, each lens element providing prescription (Rx) correction generally in the range -6.0 D to +6.0 D with 0 to +3 cyl

wherein the front surface is capable of being mounted in a frame of constant design curve irrespective of the Rx, such frame curves being 5.0 D and above; and

the back surface provides good clearance from temples or eye lashes.

13. A unitary lens according to claim 12, wherein the lens provides true Rx correction in the prescription (Rx) zone for a wearer up to 50° off axis and terminating in a peripheral temporal zone, that provides clear perception of objects in the peripheral area of human vision and avoids prismatic jump from the prescription zone to the peripheral temporal zone.

14. A unitary lens according to claim 13, wherein the prescription zone extends up to 80° off axis.

15. An optical lens element adapted for mounting in a frame of the wrap-around or shield type, such that the lens element is rotated temporally about a vertical axis through the optical centre thereof, the lens element including

a front and back surface capable of forming a prescription (Rx) zone; and optionally

a peripheral temporal zone;

the front and/or back surface bearing a surface correction to at least partially adjust for errors including astigmatic and mean power errors.

16. An optical lens element according to claim 15, wherein the front and/or back surface further includes a surface correction to at least partially adjust for prismatic errors.

17. An optical lens element according to claim 16, wherein the front and/or back surface includes a toric component and bears a surface correction to at least partially adjust for on-axis astigmatic and mean power errors.

18. An optical lens element according to claim 17, wherein the front and/or

back surface includes an aspheric component selected to at least partially adjust for off-axis astigmatic and mean power errors as well as prismatic disparity.

19. An optical lens element according to claim 18, wherein the front surface is an aspheric surface that includes appropriate aspheric co-efficients to define a peripheral temporal zone.

20. An optical lens element according to claim 19 wherein the aspheric front surface exhibits line symmetry about the horizontal geometric axis thereof.

21. An optical lens element according to claim 20 wherein the aspheric surface exhibits line symmetry about the vertical geometric axis thereof.

22. An optical lens element according to claim 21 wherein the aspheric surface includes a correction in the horizontal direction.

23. An optical lens element according to claim 15, wherein the back surface includes a base curvature such that the patient's required prescription power, Rx, in the prescription zone is achieved; the back surface being further modified to complement the front surface selected.

24. An optical lens element according to claim 23, wherein the back surface includes a toric or spherical component selected to achieve the prescribed optical power and the prescribed lens cylinder correction.

25. An optical lens element according to claim 24, wherein the back surface further includes an astigmatic error correction to compensate for lens wrap.

26. An optical lens element according to claim 25, wherein the surface is an aspheric toric surface and includes an adjustment to correct for off-axis astigmatic and/or mean power errors.

27. An optical lens element according to claim 15, including

an aspheric front surface that includes a base curvature appropriate for high base curve lenses and appropriate aspheric co-efficients to define a peripheral temporal zone; and

a back surface of appropriate curvature to provide the prescribed optical lens power and prescribed lens cylinder and including adjustments for astigmatic and mean power error correction to compensate for lens wrap.

28. An optical lens element according to claim 15, wherein the back surface includes a toric or spherical component.

29. An optical lens element according to claim 15, including

a front surface including a spherical or toric component designed to provide the desired prescription (Rx) in the prescription zone, and bearing a surface correction to at least partially adjust for errors including astigmatic and mean power errors, in combination with the back surface,

and including appropriate co-efficients to define a peripheral temporal zone; and a transition section therebetween designed to smoothly blend the prescription zone and peripheral temporal zone,

a back surface modified to complement the front surface.

30. An optical lens element adapted for mounting in a frame of the wrap-around or shield type, the lens element including

a front and back surface capable of forming a prescription (Rx) zone; and optionally

a peripheral temporal zone

wherein the optical axis is decentred relative to the geometric axis of the lens element to provide for prismatic correction,

the front and/or back surface bearing a surface correction to at least partially adjust for errors including astigmatic and mean power errors.

31. An optical lens element according to claim 30, wherein the lens element is rotated temporally about a vertical axis through the optical centre thereof.

32. An optical lens element according to claim 30, wherein the front and/or back surface further includes a surface correction to at least partially adjust for off-axis astigmatic and mean power errors as well as prismatic disparity.

33. A laminate optical article adapted for mounting in a frame of the wrap-around or shield type, including

a front lens element;

a complementary back lens element, the front and back surfaces of the laminate optical article being capable of forming a prescription (Rx) zone;

the front and/or back surface bearing a correction to at least partially adjust for error including astigmatic and mean power errors;

the front and/or back lens element optionally including

a peripheral temporal zone.

34. A laminate optical article according to claim 33 wherein the laminate article is rotated temporally about a vertical axis through the optical centre thereof, or the optical axis is decentred relative to the geometric axis, or the lens element is both rotated and decentred.

35. A laminate optical article adapted for mounting in a frame of the wrap-around or shield type, such that the laminate article is rotated temporally about a vertical axis through the optical centre thereof, including

a front lens element;

a complementary back lens element, the front and back surfaces of the laminate optical article being capable of forming a prescription (Rx) zone;

the front and/or back surface bearing a correction to at least partially adjust for errors including astigmatic and mean power errors;

the front and/or back lens element optionally including

a peripheral temporal zone.

36. A laminate optical article according to claim 35, wherein

the front lens element is generally plano; and

the corresponding back lens element includes a lens element of positive or negative power.

37. A method of designing an optical lens element adapted for mounting in a form of the wrap-around or shield type, which method includes

providing

mathematical or numerical representation of a surface of an optical lens element including a section designed to provide the desired prescription (Rx) in the prescription zone; and optionally adding thereto a mathematical or numerical representation of a peripheral temporal zone to define a complete lens surface;

rotating and/or decentring the representation of the lens surface to permit mounting in a suitable frame; and

modifying the representation of the lens surface to at least partially correct for astigmatic errors.

38. A method according to claim 37 including providing a mathematical or numerical representation of an aspheric front surface of an optical lens element

including a section designed to provide the desired prescription (Rx) in the prescription zone and having appropriate aspheric co-efficients to define a peripheral temporal zone;

rotating and/or decentring the representation of the lens surface to permit mounting in a suitable frame;

subsequently providing a mathematical or numerical representation of a prescription (Rx) back surface; and

modifying the representation of the back surface of the lens element to at least partially adjust for errors including astigmatic and mean power errors.

39 A method according to claim 38, including

providing

a mathematical or numerical representation of a surface of an optical lens element including a section designed to provide the desired prescription (Rx) in the prescription zone; and adding thereto

a first mathematical or numerical representation of a peripheral temporal zone thereto; and

a second mathematical or numerical representation of a transition section designed to smoothly blend the prescription section and peripheral temporal zone to define a complete lens surface;

rotating and/or decentring the representation of the lens surface to permit mounting in a suitable frame; and

modifying the representation of the lens surface to at least partially adjust for errors including astigmatic and mean power errors.

40. A method according to claim 39 wherein a surface of the optical lens element is represented by the following formulas

$$sag = SAG \qquad R \leq Ro,$$

wherein R is the radius measured from the optical axis and A_2, A_4, A_6 and A_8 are coefficients that define power and asphericity;

$$sag = SAG + DSAG \qquad R \geq Ro.$$

wherein R_0 defines the periphery of the temporal region; and

$$DSAG = B_2 (R\text{-}Ro)^2 + B_4 (R\text{-}Ro)^4 + B_6(R\text{-}Ro)^6 + B_8(R\text{-}Ro)^8$$

wherein B_2, B_4, B_6 and B_8 are co-efficients that define power and asphericity.

41. A method according to claim 40 wherein the surface is represented by the formula

$$sag = SAG + \alpha(DSAG)^N \quad \text{for } R \geq Ro,$$

where α and $N \geq 1$ are numerical parameters

42. An optical lens element according to claim 1, modified to accentuate facial form in the nasal region and including a region of reduced or opposite curvature defining a nasal accentuating region.

43. Spectacles including

a spectacle frame of the wrap-around type adapted to receive a pair of ophthalmic lenses such that each lens is rotated temporally about a vertical axis through the optical centre thereof; and

a pair of optical lenses, each lens including

a front and/or back surface capable of forming a prescription (Rx) surface; and

a temporal zone

the front and/or back surface bearing a surface correction to at least partially adjust for errors including astigmatic errors.

44. Spectacles including

a spectacle frame of the wrap-around type;

a pair of optical lens elements which lens elements provide true Rx correction in a prescription (Rx) zone for a wearer up to 60° off axis, preferably 80° off axis, and terminating in a peripheral temporal zone, that provides clear perception of objects in the peripheral area of human vision and avoids prismatic jump from the prescription zone to the peripheral temporal zone